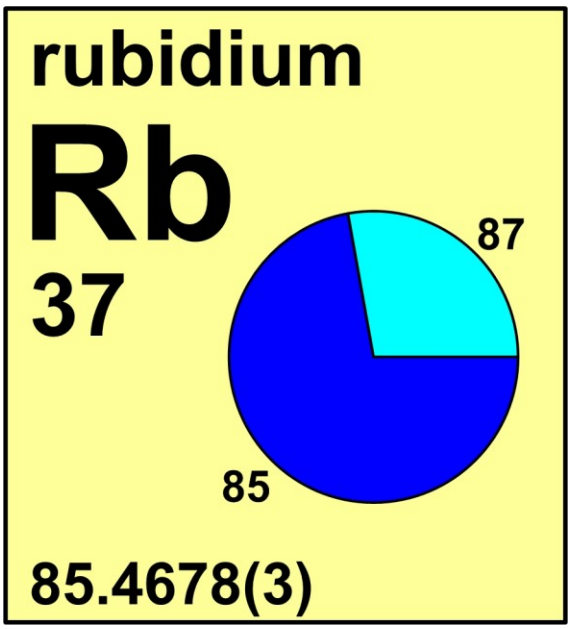
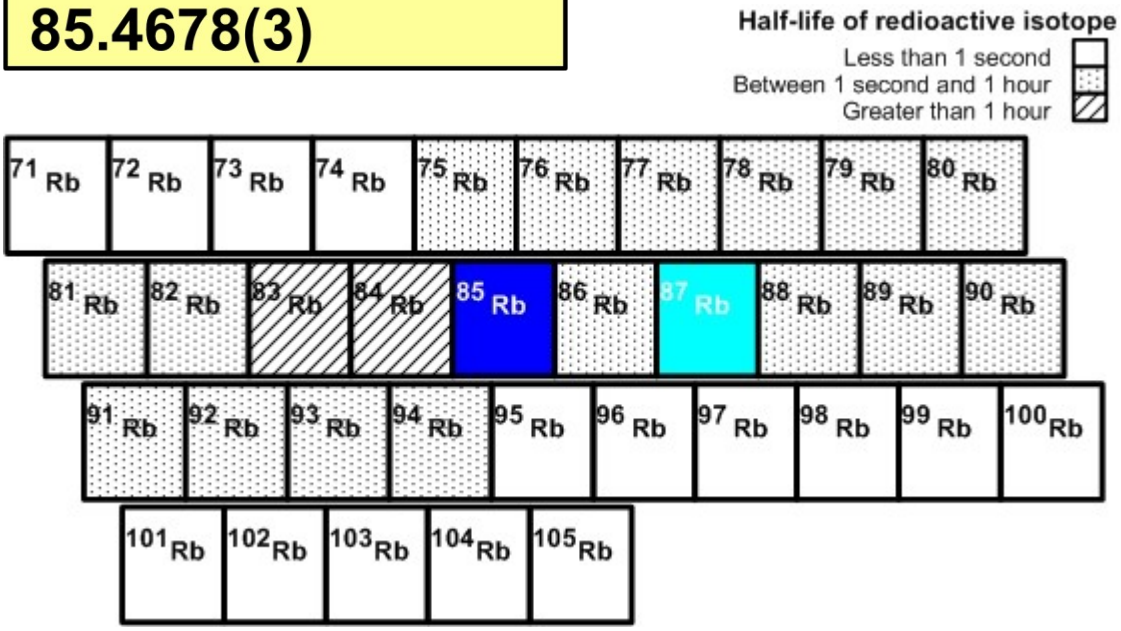
rubidium



Stable isotope	Atomic mass*	Mole fraction
^{85}Rb	84.911 789 74	0.7217
^{87}Rb	86.909 180 53	0.2783

* Atomic mass given in unified atomic mass units, u.



Important applications of stable and/or radioactive isotopes

Isotopes in geology

1) ^{87}Rb is a long living radioisotope that is transformed into ^{87}Sr by emission of a beta particle (half-live: 49.23 billion years). From the abundance of ^{87}Sr and the rubidium and strontium concentration in a rock, its age of crystallization can be calculated. Rb/Sr dating is one of the most widely employed techniques for dating of geological samples.

Isotopes in medicine

1) Stable isotopes of ^{85}Rb can be used to study potassium (K) metabolism in patients suffering from mental illness. Both natural Rb isotopes (^{87}Rb, ^{85}Rb) are NMR active and hence have been used to study cation fluxes or coordination in aqueous solutions as tracers for the less sensitive K.
2) ^{82}Rb (half-live 1.26 min) is a PET agent used for myocardial perfusion imaging to assess heart muscle function as a potassium analogue. It is obtained by decay of accelerator produced ^{82}Sr concealed in dedicated devices containing the mother nuclide (^{82}Rb generators). Because of the short half-life of ^{82}Rb, generators are used at the site of patient administration.
3) ^{82}Rb has also been used to study blood-brain barrier changes in Alzheimer patients.

Isotopes in tracer studies

1) The radio-nuclide ^{86}Rb can be used as a tracer in biological or medical investigations for applications where the half-life of the radio-tracer ^{42}K is too short.